

Water Resources

. Multiple choice questions.

(i) Based on the information given below classify each of the situations as 'suffering from water scarcity' or 'not suffering from water scarcity'.

- (a) Region with high annual rainfall.
- (b) Region having high annual rainfall and large population.
- (c) Region having high annual rainfall but water is highly polluted.
- (d) Region having low rainfall and low population.

Solution : (i) Not suffering from water scarcity

Explanation: Regions with high annual rainfall cannot face scarcity of water because the water table is replenished, water bodies do not dry up so no water scarcity.

(ii) Which one of the following statements is not an argument in favour of multipurpose river projects?

- (a) Multi-purpose projects bring water to those areas which suffer from water scarcity.
- (b) Multi-purpose projects by regulating water flow helps to control floods.
- (c) Multi-purpose projects lead to large scale displacements and loss of livelihood.
- (d) Multi-purpose projects generate electricity for our industries and our homes.

Solution : (ii) (c) Multi-purpose projects lead to large scale displacements and loss of livelihood.

Explanation: Multipurpose projects and large dams have also been the cause of many environmental movements like the Narmada Bachao Andolan and Tehri Bachao Andolan etc. Resistance to these projects has primarily been due to the large scale displacement of local communities. Local people often had to give up their land, livelihood and their meagre access and control over resources for the greater good of the nation.

(iii) Here are some false statements. Identify the mistakes and rewrite them correctly.

- (a) Multiplying urban centres with large and dense populations and urban lifestyles have helped in proper utilisation of water resources.
- (b) Regulating and damming of rivers does not affect the river's natural flow

and its sediment flow.

(c) In Gujarat, the Sabarmati basin farmers were not agitated when higher priority was given to water supply in urban areas, particularly during droughts.

(d) Today in Rajasthan, the practice of rooftop rainwater harvesting has gained popularity despite high water availability due to the Rajasthan Canal.

Solution : (iii) (a) Multiplying urban centers with large and dense populations with urban lifestyles have added to the water and energy requirement and thus, caused the over exploitation of water resources.

(b) Regulating and damming of rivers affect their natural flow and causes the sediment to settle at the bottom of the dam.

(c) In Gujarat, the Sabarmati basin farmers agitated over the higher priority given of water supply in urban areas, particularly during droughts

(d) Today in Rajasthan, the practice of rooftop rainwater harvesting is on the decline as plenty of water is available due to perennial Rajasthan canal.

Answer the following s in about 30 words.

2. (i) Explain how water becomes a renewable resource.

(ii) What is water scarcity and what are its main causes?

(iii) Compare the advantages and disadvantages of multi-purpose river projects.

Solution :

(i) Water is a renewable resource as it is renewed by water cycle itself, where three processes take place as evaporation, condensation and precipitation.

This process of water cycle is never ending and hence, water is a renewable resource. The water then runs into rivers and dams where it is used and the waste is partially cleaned before it makes its route to the sea, where the cycle begins again. Freshwater is mainly obtained from surface runoff and groundwater that is continually being renewed and recharged through the hydrological cycle.

(ii) Water scarcity or water stress occurs when water availability is not enough to match the demand for water. It is caused by an increase in population, growing demand for water, urbanisation, industrialisation, wastage injudicious use and unequal access to it. A large population requires more water not only for domestic use but also to produce more food. The ever increasing number

of industries has made matters worse by exerting pressure on existing fresh water resources. Fragile water resources are being over-exploited and have been depleted in cities. Water scarcity may also be due to the bad quality of water. Lately there has been a growing concern that even if there is ample water to meet the needs of the people, much of it may be polluted by domestic and industrial wastes, chemicals, pesticides and fertilizers used in agriculture, thus, making it hazardous for human use.

(iii) Multipurpose river projects help in irrigation, electricity production, flood control, the supply of water for domestic and industrial use, recreation, inland navigation and fish breeding. It integrates development of agriculture and the village economy with rapid industrialization and growth of the urban economy. However, the reservoirs destroy local flora and fauna. Dams fragment the river thus making it difficult for aquatic fauna to migrate and for spawning. Many native villages are submerged, and people lose their livelihood, with little or no hope of rehabilitation. The dams that were constructed to control floods have triggered floods due to sedimentation in the reservoir. It was also observed that the multi-purpose projects induced earthquakes, caused waterborne diseases and pests and pollution resulting from excessive use of water.

Answer the following s in about 120 words.

3. (i) Discuss how rainwater harvesting in semi-arid regions of Rajasthan is carried out.

Solution :

(i) Houses in the semi arid regions of Rajasthan have traditionally constructed tanks for storing drinking water. The tanks could be as large as a big room. They are big and are a part of the well-developed rooftop rainwater harvesting system. The tanks are constructed inside the main house or the courtyard and are connected to the sloping roofs of the houses through a pipe. The rain falling on the rooftop travels down and is stored in the underground tanks. The first spell of rain is not collected as this water cleans the roof and the pipes. The rainwater from the subsequent spells is collected. This water is used untill the next rainy season and is a reliable source of water even after other sources have dried up. The tanks also help in cooling the houses as rooms built around them have generally low temperatures due to conduction.

(ii) Describe how modern adaptations of traditional rainwater harvesting methods are being carried out to conserve and store water.

Solution :

(ii) Traditional methods of rainwater harvesting like 'the rooftop method' are becoming popular in India. In Gendathur village, Mysore, about 200 households have adopted the rooftop rainwater harvesting method, thereby making the village rich in rainwater. The state of Tamil Nadu has made it compulsory for all the houses to have rooftop rainwater harvesting structures. There are legal provisions to punish the defaulters. Rooftop rainwater harvesting is the most common practice in Shillong, Meghalaya. Rooftop harvesting is common across the towns and villages of the Thar. In Meghalaya, a 200 year old system of tapping stream and spring water by using bamboo pipes is prevalent. About 18 to 20 litres of water enters the bamboo pipe system and gets transported over hundreds of metres.

